

Biomedical Electrodes

1. Why do electrodes have different backing materials?

In general, electrodes have different backing materials for differing applications. For example a longer term electrode needs to permit normal skin respiration, hence we tend to find these have soft cloth or 3M™ Micropore™ backings, which not only allow the skin to breathe, but also stretch with the movement of the patient. Short term electrodes usually have a high initial adhesion, and these have foam backings, to support the additional weight of adhesive applied to them. However, the very latest electrodes have a non-porous backing material, but can be worn for up to 5 days without skin irritation. This is achieved by the use of innovative, state of the art skin adhesive technologies.

2. What is the difference between wet gel and solid gel?

Wet gel has an advantage in that it acquires an ECG signal slightly faster than solid gel, because it tends to hydrate the skin and thus enhance the conduction channels. However in none but the most demanding situations would this become apparent. The latest conductive adhesive 'gels', tend to hydrate faster than the more conventional solid gel type electrodes.

3. Are all 3M electrodes latex free?

Yes, all 3M electrodes are free from natural or synthetic latex.

4. Are all 3M™ Red Dot™ Electrodes hypoallergenic?

Yes, all 3M electrodes are hypoallergenic.

5. Why is skin abrasion recommended prior to attaching electrodes?

The surface of the skin is covered with a dry layer called the Stratum Corneum. The electrical resistance of this varies between individuals, and does not appear to be related to sex or race. Abrading the skin prior to electrode application, can reduce the resistance of the skin to one tenth of unabraded skin, therefore enabling more of the wanted ECG signal to reach the electrode, as opposed to unwanted signals.

6. Can 3M electrodes be used for MRI procedures?

We do not have studies that support the use of these products in this procedure.

7. What is the shelf life of 3M electrodes?

The shelf life is two years from the date of manufacture, in an unopened pouch. The date of expiry is printed on the pouch following the Lot Number.

8. What electrode would you recommend for use on patients with sensitive skin?

First of all, try the 3M™ Micropore™ of the 2238, or the soft cloth backing materials of the 2239 or 2271 electrodes. If these continue to cause irritation progress to the 2248 paediatric electrode, even going as far as the 2269T neonatal electrode, if the 2248 is not satisfactory.

9. How long do the electrodes stay fresh after the bag is opened?

The electrodes stay fresh for 30 days in an open bag, or tray, but up to sixty days if the bag is double folded.

10. What is the best technique for applying and removing electrodes?

Electrodes should be applied with a circular smoothing motion to the skin, ensuring that the edges are in good contact with the patient. Contrary to popular opinion, electrodes are NOT best removed from the patient with a rapid pull. This may cause a skin reaction that mimics sensitivity to some component of the electrode, and indeed may damage fragile or thin skin. The electrode should be gently lifted and the skin supported, and counter-stretched against the pull of the electrode. The ideal angle for removal from the skin is that the section being removed is at 120° from the counter-stretched skin.

11. What does the 3M 'Good as Gold Guarantee' mean?

The 'Good as Gold Guarantee' means we will replace any electrode found to be unsuitable for use, free of charge, including previously opened/part pouches.

12. Does 3M have a range of cables and leadwires?

Yes, we have a limited range of cables and leadwires for the most popular monitors and applications.

13. Does 3M offer an ECG training package?

Yes. We have a tutor-lead session that utilises a video, and leaves the students with both a handbook and swatch cards of the most common ECG pathologies.

14. Why does 3M not produce an electrode with an offset stud?

The offset stud was originally designed to prevent the wet gel conductive element of the electrode from being squeezed under the skin adhesive, when the press stud was attached to the electrode. This caused poor skin adhesion, and increased artefacts. It was later found to be an advantage when the connector to the electrode was a press stud, and the electrode was being positioned over a bony area, causing less discomfort to the patient on connection to the leadwire. However, the 'hinged' area of the connection to the offset stud, generates electrical noise when flexed. This electrical noise could interfere with correct ECG diagnosis.

Additionally, the preferred connector is no longer the press stud, but the squeeze clip. This connects securely to the electrode without any downward pressure on the patient, negating the marginal benefit and cost of an offset tab connector.

15. Should the skin be wiped with alcohol before applying the electrode?

Preferably not. However, it is useful if the patient has an oily/diaphoretic skin type, to improve adhesion. If used, the area should be dried well before application of the electrode. Alcohol increases the skin resistance of human subjects, for an indeterminant time period.

Defib-Pads

1. Is it possible to monitor the heart rhythm through a defib paddle/3M™Defib-Pad combination?

We make no claims as to this function. In addition, 3M™ Defib-Pads are not designed as a coupling medium for ECG signals.

2. Why is there sometimes excess moisture in the pack, is this dangerous?

Excess moisture is caused by the product having been subjected to a freeze thaw cycle, somewhere between manufacture and use on the patient. Whilst this is an inconvenience, tests have shown that it does not impair the performance of the product.

3. Are 3M™ Defib-Pads sterile?

No. It is difficult to imagine a situation in which sterile defib pads would be called for. They are however 'clean' in terms of medical definitions.